

10-27-04

2684
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In The United States Patent And Trademark Office

Appn. Number: 09/991,508

Appn. Filed; 11/16/2001

5 Applicants: Franklin ZhiGang Zhang

Title: FIXED WIRELESS NETWORK EXTENDER

Examiner/GAU NGUTEN/2684

RECEIVED

OCT 29 2004

Technology Center 2600

Amendment A

10

Assistant Commissioner for Patents

Washington, District of Columbia 20231

Sir:

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In response to the Office Action mailed 2004 June 8th, please amend the above application as followings:

Claims:

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Claim 2 (change) line 11 change "the wireless and wired interfaces" to -said wireless networking radio units and wired networking units-

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The References and Differences Of The Present Invention Thereover

Applicant will discuss the reference and the general novelty of the present invention and its unobviousness over the reference.

Snelling et al. (US Patent 6,418,131) discloses a "system for connecting PSTN lines to telephones, handsets, computers, telecopy machine and other end user interfaces or consumer electronics devices in residence or business" (see
5 ABSTRACT). It is a system with one central unit equipment NCU communicates with plurality of other devices or units in a certain location such as residence (see Fig 1). The NCU, WAU, mobile handsets are different type of equipment or devices having different functions in the same communication system. More specifically, this system needs to have one central equipment NCU, plurality of
10 terminal devices handsets, and plurality of access units WAU. Jones (US Patent 5,410,737) disclosed a frequency agile sharing technology (FAST) system for controlling frequent usage in a communication system. Jones mentioned use directional antenna to improve the interference between the PCS base stations and other facilities.

15 The last O.A notes that Snelling et al.'s system has a similar embodiment to applicants invention, except failed to use directional antenna.

However in general, Snelling et al.'s invention disclosed a system of phone
20 communication for residence and business with one Network Control Unit (NCU) and plurality of handsets and WAU in a certain area (see Fig 1). Where the NCU is the center of the whole communication system, and, WAU and handsets are the terminals. Because of targeting wireless telephony for resident area and business area, (Fig.1) all the radio units of Snelling et al. are short distance and
25 non directional, and the system functions such as signal routing and switching are circuit connection orientated. Even though it may carry digital data, this system's design and function are different than a packet orientated computer networking system. The Applicant's present invention discloses a Fixed Wireless Networking Extender (FWNE) device and its functions of networking among

many different networks. One FWNE device is network communicating with other equipment in the network on an equal base. There is not central unit and terminal unit in applicant's present invention.

5 Snelling et al.'s embodiment functions connecting to PSTN wires and rebroadcast phone signal via Radio Multiplex Engine 670, and then RF radio to remote handsets and WAU. Rebroadcast and reorganize of PSTN line signal to RF link is a complete different function than digital computer networking communication. The Applicant's present invention embodiment comprise plurality
10 of wireless networking radio unit each with it's own antenna and each networking with different remote wireless networking device and remote network. The FWNE device of the applicant's present invention can networking different type of networking devices, which have with same type of wireless networking function as one of FWNE's wireless networking unit.

15 Snelling et al. disclose a phone networking platform comprise plurality unites of NCU, processor unit, and personal computer, WAU and so on, that need be deployed and function in a scattered area such as many places of a residence (Fig.1). Applicant's embodiment discloses a single unit system with networking
20 capability and other functions. This system unit comprises plurality of functional networking units connect to one processor unit via system bus I and II.

The Applicant's present invention has simpler system architecture and different networking function over Snelling et al. The Applicant's present invention
25 provides a flexibility of networking a much bigger communication system with different networking equipments. As long as a networking equipment can communicate with one of the networking units of the FWNE device, the network can be extend.

The Objection to The Claim 1-5 and 7-9 rejections under 35 U.S.C. 102(e) as being anticipated by Snelling et al. (US Patent 6,418,131).

5 The last O.A. rejected the Claims 1-5 and 7-9. Applicant requests reconsideration of these rejections.

Objection to Rejection of Claim 1 On Snelling et al.

Snelling et al. (see col.9 lines 15-45) disclosed a "Control Processor 685" for commanding switching, routing, RF, accessory and other functionality
10 implemented in CAB 660, Radio Transceiver 680 and other circuits in NCU 100. Because of different system architecture between Snelling et al. and the Applicant's present invention, the system software and networking software are completely different in both systems. For example, Snelling et al. software need to "step-by-step, lines 640 are match in the CAB 660 to various WAUs 200,
15 handsets 300 and other devices (col.9 25-32)"; However, the processor unit 164 of the Applicant's present invention "performs the networking features such as routing, bridging and etc, and also networking management functions". These two inventions have complete different system software with different function and purposes. Snelling et al.'s Control Processor 685 has the function to control
20 Radio Transceiver 680, it is different the processor unit 164 of the Applicant's present invention which functions with wireless networking radio units 102, 112, 122, 132. A Radio Transceiver is a device that both transmits and receives analog or digital signals. A wireless networking radio typically comprises radio a RF front-end, a baseband processing unit, and media access control unit. It is a
25 much more complicated device. In conclusion, the processor unit 164 of the Applicant's present invention is completely different than Snelling et al.'s Control Processor 685, and with much more sophisticated system and networking capability.

Snelling et al. disclosed a NCU (fig 3A-3C, col.5 25 – col.12 30). Also, Snelling et al. (see 720,750, fig.3A), disclosed two buses to which where “radio multiplex engine 670” is connected to bus 750, while “network interface to PSTN (wired lines) 650” is connected to bus 720. Further, bus 750, and 720 need be inter-
5 connected to the “switching, bridging and accessory circuitry as shown 660 (see col.5 line 33-34)”. The two buses of Snelling et al. 720, 750 belong to switching, bridging and accessory circuitry 660 but not the control processor 685. In the present invention of applicant, two system buses are direct system bus extension of processor unit (fig.1) where wired and wireless can be both attach to. As
10 example shown in (fig.1 of present invention), radio unit 102, 112 and wired networking units 167,168 are connecting to bus 161. And there is no “switching, bridging and accessory circuitry” in Applicant's present invention. Because of the two buses of Snelling et al. 720, 750 belong to switching, bridging and accessory circuitry 660, these two buses are simply cross-connecting, switching and
15 bridging among the PSTN (phone) lines. These types of bus are much simpler and much less functional than a system bus that directly connected to processor. It is obvious that the bus architecture of the Applicant's present invention is completely different and more sophisticated than Snelling et al.'s.

20 Snelling et al. (see fig.4 and col.7 line 65-66) disclosed plurality of “Wireless Access Units 200 and/or handset 300 as programmed in Control Processor 685”. These device / units are deployed outside of NCU as mobile or remote devices (Fig1). They communicate with NCU 100 via RF communication as client/terminal units. In the present invention of applicant, plurality of wireless unit
25 is in the same unit and connected to system buses and processor unit 164. Multiple of FWNE devices can communicate to each other via RF links. (fig2-4). The embodiment of present invention of Applicant is completely different than Snelling et al. disclosed, and, can communicate and network with remote wireless networking equipment vs. just access terminal.

Snelling et al. (see fig.7) disclosed plurality of wired connection units to wired network for phone service via RJ-11 JACKs, where signal pass through transformer A1, Hybrid A2, CODE A3, and then enter ASIC A13, and then enter to radio transceiver A15 and antenna. Snelling et al. disclosed a plurality of wired phone connections with discrete components RJ-11 JACK, A1, A2, A3 and RD RING DETECT unit. Assuming we consider the combination of the above discrete as a whole unit, this unit is connected to ASIC A13 with CODEC interface. The Microprocessor A14 picks up the signal from RD RING DETECT and performs control to ASIC A13. The embodiment of Applicant's invention comprises a plurality of wired networking unit with wired networking capability such as fiber networking, Ethernet networking to wired network. As shown on fig.1, all of these wired networking unit are connected to computer system BUS I and BUS II, and function with processor directly. It is obvious the wired networking unit of applicant's present invention is different and has more sophisticated network communication functions than Snelling et al.'s disclosure where the wired networking unit is just a plain phone communication circuitry with voice CODEC.

In conclusion, the system architecture of Applicant's present invention provides advantage over Snelling et al. with less function blocks, simpler system architecture, better system integrity, easier installation. The FWNE device of Applicant's present invention can extend the communication network to many more devices and scale vs. Snelling et al.'s disclosure which can only extend the communication from NCU to terminal device handset or WAU. The FWNE device of Applicant's present invention has much more sophisticated network communication capability than Snelling et al.'s disclosure.

Accordingly applicant submit that the claim dose comply with § 102 and therefore requests withdrawal of this rejection.

Objection to the Rejection of claim 2 On Snelling et al.

5 Snelling et al. (see col.7 line 61 though col.8 line 31) disclosed a CAB 660 design with local control processor 685 and personal computer 687. And it is "under the control of a local Control Processor 685 and personal computer 687 (col.7 line 62-63)". Snelling et al. provide a combined system platform for voice and date package exchange among the NCU interfaces. The embodiment of applicant's
10 invention provides system platform with only one processor unit and two system buses. There is not addition personal computer needed in Applicant's present invention.

Snelling et al. (see col.7 line 61 though col.8 line 31) disclosed a CAB 660 design to route, switch voice and data signal between PSTN Network Interface 651
15 (Fig.3A) and Radio Multiplex Engine 670. The networking function of routing, switching voice and data signal between PSTN Network Interface 651 (Fig.3A) and Radio Multiplex Engine 670 is different than the networking function of exchanging networking packets among the wired networking units and wireless networking radio units. The networking system function of the Applicant's present
20 invention exchanges networking packets among the wired networking units and wireless networking radio units. There are not additional control processor 685 and PC 687 needed in Applicant's present invention in order to perform the networking functions. Thus, the Applicant provide a much simpler system architecture of system platform with different networking function over prior art of
25 Snelling et al.

Further, plurality of FWNE equipments of applicant's present invention can network together to form a bigger topology of a communication network. This is part of extension function of FWNE system. The prior art of Snelling et al. one NCU communicates with plurality of WAU and handset to form the

communication network. The wireless extension of Snelling et al. limited between a central unit NCU and plurality of WAUs and handsets. The system function of applicant's present invention has a much wider of networking capability over Snelling et al. For example, the FWNE device can network with and equipment with the same type of wireless networking capability, such as another FWNE device. Note that Snelling et al. disclosed a system comprises one NCU 100, WAU 200, handsets 300 and wireless Control/Monitoring Accessories 350. (see col.13 line 35-40). This is a system with NCU 100 as center star network topology (see col 13 line 57-60) communicating with remote terminal devices such as handsets 300. It is obvious that multiple of FWNE can be flexibly networked together and form a much bigger wireless communication network. Snelling et al's embodiment is only a star topology local communication network with 4 different types of devices, and one of them has to be the central unit NCU 100.

Accordingly applicant submit that the claim does comply with § 102 and therefore requests withdrawal of this rejection.

Objection to the Rejection of claim 3 On Snelling et al.

Snelling et al. (see col.2 lines 65 through col.3 line 45) disclose a possible wireless modular connectivity between any desired devices and the PSTN with the residence. This is an embodiment of extending the PSTN network to wireless handset users. All of the digital radio modem 680 of Snelling et al. can be modular selectable but need to be connected to a radio multiplex engine 670. The embodiment of applicant's invention disclosed a wireless networking radio unit modular architecture connected to processor system bus directly without the radio multiplex engine 670 of Snelling et al.. Further, because of the two buses of applicant's present invention are directly connected to processor unit with much

more bus capability, the wireless networking unit has more networking and communication function than the digital radio modem 680 of Snelling et al.. The embodiment of applicant's invention has a better system architecture with fewer components, and, more flexible and capable system functions than Snelling et al.'s disclosure.

Accordingly applicant submit that the claim dose comply with § 102 and therefore request withdrawal of this rejection.

10 Objection to the Rejection of claim 4 On Snelling et al.

Snelling et al. (see col.13 line 55-65) disclose a NCU 100 to selects RF channels of whole entire network (of the residence). Because of the system architecture advantage the Applicant's present invention over prior art, when plurality of same type of wireless networking radio unit working in the same FWNE system with different channel, all the wireless networking radio units are connected to processor system bus directly without a radio multiplex engine 670 of Snelling et al.. The embodiment of has a better system architecture with fewer components, and, more flexible and capable system functions than Snelling et al.'s disclosure. Further, because of simpler one unit architecture, the FWNE device of applicant's present invention can be installed difficult geographical location, and with directional antenna to provide a better RF separation. Thus improve system reliability and function of the whole system. The wireless networking radio unit modular channeling of Applica'n't present invention has advantage of simpler system architecture and provides better function for application over Snelling et al. Because of the function of the RME 670 of Snelling et al. (see col.5 line 52-60) is only "multiplexes the signales", the networking function of the NCU if any, is performed some where else. Thus, it is very limited. Accordingly, another advantages of connecting direct to system bus as disclosed by applicant's

present invention is allowing system to perform more complicated networking and communication functions.

Accordingly applicant submit that the claim dose comply with § 102 and therefore
5 requests withdrawal of this rejection.

Objection to the Rejection of claim 5 On Snelling et al.

10 Snelling et al. (see col.13 line 1-15) disclosed a digital Wireless Access Unit 200 shown in Fig6. Where the unit work as a wireless extension of ISDN lines, and “performing a buffering, error control, and protocol conversion function”. This WAU has a different embodiment than the FWNE device of applicant’s present invention. Further, the FWNE device of applicant’s present invention is a self-
15 contained complete function networking communication device. The WAU of Snelling et al. is just an ISDN line extension unit to computer via MICROPROC PORT (Fig.6). It is obvious that FWNE can perform much sophisticated networking and communication functions than the WAU of Snelling et al.

20 Note that Snelling et al (see Fig 6) disclosed a TDD/TDMA radio transceiver A35. A radio transceiver is a simple communication device that dose radio signal transmit and receive. Selection of different radio transceiver is un-equivalent to selection of different wireless networking radio units as disclosed by applicant’s present invention.

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In applicant’s invention where the different type of wireless networking radio units are modular units that interfacing to the main system via BUS I or II.

Accordingly applicant submit that the claim dose comply with § 102 and therefore requests withdrawal of this rejection.

5 Objection to the Rejection of claim 7 On Snelling et al.

Snelling et al. (see col.3 lines 9-30) disclose an addition node device that is standalone device to which "base units or network control units can report information" and "Such information at the node can be useful for purposes such as help desk functionality, design modifications, and adjustment of the operation".

10 This is a special standalone device functions among the communication system formed by NCU and many other device as a standalone equipment for coordination of whole system. The radio control unit of applicant's invention is a built-in function unit inside the FWNE system for the purpose of controlling the performance of networking radios inside the FWNE device. The function,
15 purpose, and implementation if applicant's invention is complete different then the "node device" disclosed by Snelling et al.

Compare to Snelling et al., the Applicant's present invention dose not need an additional standalone equipment to do the system information control among different equipments of the communication system. When forming a high

20 capacity communication network with many different radio communications, it is much easier to manage the radio modules inside each device like the Applicant's present invention, than a stand alone control node disclosed by Snelling et al.

Accordingly applicant submit that the claim dose comply with § 102 and therefore
25 requests withdrawal of this rejection.

Objection to the Rejection of claim 8-9 On Snelling et al.

Snelling et al. (see col.8 line 60 through col.9 line 15) disclosed a "NCU switching, Bridging and Accessory Block functionality" (CAB 660, see col.7 line 37) "may reside on board the NCU". According to Snelling et al. (Fig. 3A, and see col. 7 lines 37- 68) a switching, Bridging and Accessory Block (CAB 660) provides a

5 bus cross connection between Network Interface to PSTN 650 and Radio Multiplex Engine 670. Even if all the Fig.3A of Snelling et al. except PC 687 to be building one board and integrate PC 687 into one complete unit, this is still not a one board solution. Further the cost and complexity make almost impossible to build the whole Fig.3A into on board due to the nature of Snelling et al.

10 architecture.

In Applicant's present invention all the wireless networking radio units and wired networking units may be modular and/or build on one PCB. These units maybe turn on or off to configure the FWNE device with different networking function capability. Because there is not additional PC needed, the embodiment of

15 Applicant's present invention can be a one broad device with provide multiple combination of features. Apparently, the Applicant's present invention provides a significant advantage over Snelling et al. with better system integrity, smaller size, easier installation, less cost, simpler system integration and more function.

20 Accordingly applicant submit that the claim dose comply with § 102 and therefore request withdrawal of this rejection.

**Snelling et al. And Jones Do Not Contain Any Justification To Support
25 Their Combination, Much Less In The Manner Proposed**

With regard to the proposed combination of Jones radio unit with directional antenna to put on the facility and other base stations, it is well know that in order for any prior-art reference themselves to be validly combined for use in a prior-art § 103 rejection, *the references themselves* (or some other prior art) must

suggest that they be combined. E.g., as was stated in In re Sernaker, 217 U.S.P.Q. 1.6 (C.A.F.C. 1983):

5 “[P]rior art references in combination do not make an invention obvious unless something in the prior art references would suggest the advantage to be derived from combining their teachings.”

That the suggestion to combine the references should not come from applicant was forcefully stated in Orthopedic Equipment Co. v. United States, 217 U.S.P.Q. 193,199 (CAFC 1983):

10 “It is wrong to use the patent in suit [here the patent application] as a guide through the maze of prior art references, combining the right references in the right way to achieve the result of the claims in suit [here the claims pending]. Monday morning quarterbacking is quite improper when resolving the question of nonobviousness in a court of law [here the
15 PTO].”

As was further stated in Uniroyal, Inc. v. Rudkin-Wiley Corp., 5 U.S.P.Q.2d 1434 [C.A.F.C. 1988], “[w]here prior-art reference require selective combination by the court to render obvious a subsequent invention, there must be some reason for
20 the combination other than the hindsight gleaned from the invention itself. *Something in the prior art must suggest the desirability and thus the obviousness of making the combination.*”[Emphasis supplied.]

In line with these decisions recently the Board stated in Ex parte Levengood, 28
25 U.S.P.Q.2d 1300 [P.T.O.B.A.&I. 1993]:

“In order to establish a *prima facie* case of obviousness, it is necessary for the examiner to present *evidence*, preferably in the applied prior art, or in the form of generally available knowledge, that one having ordinary skill

in the art *would have been led to* combine the relevant teachings of the applied references in the proposed manner to arrive at the claimed invention. ... That which is within the capabilities of one skilled in the art is not synonymous with obviousness. ... That one can *reconstruct* and/or

5 explain the theoretical mechanism of an invention by means of logic and sound scientific reasoning does not afford the basis for an obviousness conclusion unless that logic and reasoning also supplies sufficient impetus to have led one of ordinary skill in the art to combine the teachings of the reference to make the claimed invention. ... Our reviewing courts have

10 often advised the Patent and Trademark Office that it can satisfy the burden of establishing a *prima facie* case of obviousness only by showing some objective teaching in either the prior art, or knowledge generally available to one of ordinary skill in the art, that 'would lead' that individual 'to combine the relevant teachings of the references.' ... Accordingly, an

15 examiner cannot establish obviousness by locating references which describe various aspects of a patent applicant's invention without also providing evidence of the motivating force which would impel one skilled in the art to do what the patent applicant has done."

20 In the present case, there is no reason given in the last O.A. to support the proposes combination.

The O.A. Noted [p.4] to modify the system of Snelling et al. with the directional antenna teaching of Jones is in appropriate. Because Snelling et al.'s wireless

25 communication system is in the field of home mobile wireless communication, (see Abstract) where radio frequency is lower, need and have non-directional coverage in order for all the mobile unit can communicate with the base unit while moving. A directional antenna at lower frequency is big in size. Also, a direction antenna at is a heavy and structural equipment. It is very hard to install

and use in home environment and handset. Applicant submits that the fact that combination is impossible.

Further, even if assuming Snelling et al. use an ultra high frequency microwave radio not a CDMA system as mentioned. Then because of highly directional antenna, the base unit can only possible communicate with mobile unit in one direction, and the mobile unit can only communicate to base only within that directional area and it's own antenna pointing towards base unit only. This is another obvious reason of not to combine the both system.

Further more, the higher the radio frequency, the smaller the directional antenna size, the weaker of RD wave penetration capability. If assuming Snelling et al. use an ultra high frequency microwave radio that with very small directional antenna, then the whole wireless communication became failure because of RF wave is blocked by many obstructions in home or businesses environment. Then in order for the communication to available, the Snelling et al.'s system combine with directional antenna teaching of Jones needed to be install in outdoor open environment, like the test suggest by Jones. However, none of the Snelling et al.' devices is designed to be outdoor long distance application. (see Fig.1); it is impossible to install the complicate Snelling et al.' design in any open environment, such as tower or roof top.

Applicant therefore submits that combining Snelling et al. and directional antenna teaching of Jones is not legally justified and is therefore improper. Thus the applicant submits that the rejection on these references is also improper and should be withdrawn.

Applicant respectfully request, if the claims are again rejected upon any combination of references, that the Examiner include an explanation, in accordance with M.P.E.P § 706.02, Ex parte Clapp, 27 U.S.P.Q. 972 [P.O.B.A.

1985], and Ex parte Levengood, supra, a “factual basis to support his conclusion that it would have been obvious” to make the combination.

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The Novel Physical Features Of Claim 6, Produce New And Unexpected Results And Hence Are Unobvious And Patentable Over These References Under § 103

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Also applicant submits that the novel physical features of claim 6 are unobvious and hence patentable under § 103 since it produce new and unexpected results over prior arts, or any combination thereof.

15 These new and unexpected results are the ability of applicant's apparatuses to accommodate and provide high quality and broader wireless networking and deployment capability. Applicant's apparatuses therefore are vastly superior to that of either Snelling et al. and Jones and of any possible combination thereof. There novel features of applicants apparatuses which effect these differences
20 are, as stated, clearly cited in claim 6

Conclusion

For all of the above reasons, the applicant submits that the specification and
25 claims are now in proper form, and that the claims all define patentably over the prior art. Therefore he submits that this application is now in condition for allowance, which action he respectfully solicits.

Conditional Request For Constructive Assistance

Applicant has amended the claims of this application so that they are proper, and define novel structure which is also unobvious. If, for any reason this application is not believed to be in full condition of allowance,

- 5 Applicant respectfully request the constructive assistance and suggestions of the Examiner pursuant to M.P.E.P. § 2173.02 and § 707.07(j) in order that the undersigned can place this applicant in allowable condition as soon as possible and without the need for further proceedings.

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Very respectfully,



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Date: 2004 OCT 26